REMARKS

Applicant respectfully requests reconsideration and allowance of the subject application. Claims 1-20 are pending.

Oath/Declaration

The Office objected to the Declaration because it is only relevant to application 09/539,356. The Applicant respectfully disagrees. A continuation filed under 37 CFR 1.53(b) may be filed with a copy of the declaration from the prior nonprovisional application. *See MPEP 602.05(a), 37 CFR 1.63(d)(1)(iv).* Indeed, a copy of a declaration from a prior application may be submitted with a continuation even if the declaration identifies the application number of the prior application. *See MPEP 602.05(a).* Therefore, withdrawal of the objection is respectfully requested.

Obviousness Double-Patenting

The Office rejected 1-3, 6-8, 11, 13, 14, 16-18 and 20 under the judicially created doctrine of obviousness-type double patenting. The Applicant respectfully disagrees, and will further address the rejection once all other rejections have been resolved.

35 U.S.C. §102

Claims 1-20 are rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,282,507 to Horiguchi (hereinafter, "Horiguchi"). Applicant respectfully traverses the rejection.

Claim 1 is directed to a computer-implemented method including "defining a set of reduced regular expressions for particular patterns in strings" and "learning, from a training set, a knowledge base that uses the reduced regular expressions to resolve ambiguity based upon the strings in which the ambiguity occurs, wherein the learning includes transformation sequence learning to create a set of rules that use the reduced regular expressions to resolve ambiguity based upon the strings in which the ambiguity occurs". Horiguchi does not disclose, teach or suggest these aspects.

The Office asserts Horiguchi at column one, lines 39-43 for teaching a set of reduced regular expressions for particular patterns in strings, which is excerpted as follows:

> A typical language translation system functions by using natural language processing. Natural language processing is generally concerned with the attempt to recognize a large pattern or sentence by decomposing it into small subpatterns according to linguistic rules. *Horiguchi, Col. 1, Lines 39-43.*

As shown in the excerpted portion, Horiguchi merely describes "large patterns" and "small subpatterns", and does not disclose, teach or suggest reduced regular expressions as claimed in Claim 1.

The Office asserts in the "Examination Considerations" section of the Office Action Dated July 13, 2004 that "Office personnel are to give the claims their broadest reasonable interpretation in light of the supporting disclosure" and that limitations "appearing in the specification but not recited in the claims are not read into the claim". *See Office Action Dated July 13, 2004, Page 12.* However, it is respectfully submitted that terms of a claim carry "their ordinary meaning, unless it appears that the inventor used them differently." *See Gargoyles Inc. v. United States 28 USPQ 2d 1715, 1716-17 (Fed. Cir. 1993).* Further, it "is the use

of the words in the context of the written description and customarily by those skilled in the relevant art that accurately reflects both the 'ordinary' and the 'customary' meaning of the terms in the claims". *See MPEP 2111.01, citing Ferguson Beauregard/Logic Controls v. Mega* Systems, 350 F.3d 1327, 1338, 69 USPQ2d 1001, 1009 (Fed. Cir. 2003). It is respectfully submitted that the Office's interpretation of regular expressions, and consequently reduced regular expressions, does not reflect the ordinary meaning of the terms.

Beginning at page 9 of the subject Specification, regular expressions are described as descriptions of patterns, which are both conventional and well known to those of skill in the art. As noted on page 11 of the subject Specification, however, one problem with regular expressions is that they are far too expressive for learning machines to automatically learn. To overcome this problem, Applicant's disambiguation system may employ less expressive languages, such as "reduced regular expressions" (or RRE), and "very reduced regular expressions" (or VRRE). Reduced regular expressions are strictly less powerful than regular expressions, and the very reduced regular expressions are strictly less powerful than reduced regular expressions. Horiguchi does not disclose, teach or suggest reduced regular expressions or even mention the existence of different types of expressions. Although Horiguchi does mention decomposing "a large pattern or sentence" into "small subpatterns according to linguistic rules", Horiguchi does not disclose, teach or suggest a reduction in expressiveness of the patterns. *Horiguchi, Col. 1, Lines 39-43.* Accordingly, Horiguchi does not disclose, teach or suggest "defining a set of reduced regular expressions for particular patterns in strings" as claimed in Claim 1.

The Office then asserts Horiguchi for disclosure of the previously described recitation of "learning" of Claim 1, the asserted portion of Horiguchi is excerpted as follows:

> Using this method, the system learns the types of things that the user says and improves system performance of the hypothesis construction component. The effect is that the correct hypothesis will be presented to the user as the most likely hypothesis more and more often as the user uses the device.
>
> FIG. 12 shows the hypothesis selection components of a speech translation system of an embodiment of the present invention. Operation begins with the receipt of a speech input 1201 at the acoustic speech recognition component 1202. The acoustic speech recognition component 1202 accesses and uses at least one word pronunciation dictionary 1222 and at least one acoustic model 1224 to generate at least one data structure 1204 encoding hypothesized words and their corresponding positions and time. The data structure information 1204 is used for utterance hypothesis construction 1206, wherein an ordered list of utterance hypotheses 1208 are produced. User selection-configuration 1210 then takes place, wherein a user selects the best utterance hypothesis 1210. User selection-configuration is accomplished through a user interface 1298. The user selection is used as an adaptation input 1226 to the speech translation system language models 1228. The best utterance hypothesis 1212 is used as an input to the translation component 1214 and the speech synthesis component 1216 of the speech translation system, which produce a translated speech output 1299. *Horiguchi, Col. 1, Lines 39-43.*

In making the rejection, the Office asserts that "the ordered list of utterance hypotheses represent rules produced by a transformation sequence learning". *See Office Action Dated July 13, 2004, Page 7.* The Applicant respectfully disagrees.

As previously described, Horiguchi is directed to speech translation systems. The Horiguchi system receives as input natural spoken language in a source language. The system then generates multiple recognition hypotheses and

chooses what it believes to be the best hypothesis. The system presents the best hypothesis to the user, along with the alternatives. The user can then select the desired hypothesis, which is then used to translate the input language to a target language. An example of this is shown in FIG. 13 of Horiguchi and the accompanying description, which is excerpted as follows:

> FIG. 13 is an illustration of one embodiment of a display screen. The best utterance hypothesis 1302 is displayed. In this case, the best utterance hypothesis is the sentence "I want to recognize speech." In addition to forming alternative utterance hypotheses and displaying the best utterance hypothesis, the present invention recognizes segments of the best utterance hypothesis that may have alternative hypotheses. These segments are highlighted, in this embodiment, to indicate to the user that the segment 1304 is one of a group of hypotheses. In one embodiment, if there are multiple segments that have alternative hypotheses, the largest segment is chosen as the highlighted segment. *Horiguchi, Col. 16, Lines 46-58.*

Thus, each of the hypotheses is merely a best guess for a translation of a speech input for selection by the user. Nowhere in Horiguchi is a hypothesis described having "a set of rules **that use the reduced regular expressions** to resolve ambiguity based upon the strings in which the ambiguity occurs" as claimed in Claim 1. (emphasis added).

Beginning at page 13 of the subject Specification, an exemplary set of rules that use regularly reduced expression (RRE) is described. For instance, a learning machine may create a knowledge base that employs RREs and VRREs to describe virtually any given string in which a disambiguation site occurs. For example, the learning machine can learn a rule for a "then/than" disambiguation site, such as:

> Add evidence for the proper word being "then" if the string matches the pattern: *X followed by zero or more tokens followed by a token*

that is not Y followed by Z followed by one or more tokens that are not Q followed by an R

where X, Y, Z, Q and R are particular words or features (e.g. parts of speech). Since the learning machine can learn much more expressive concepts than those learned by current state of the art techniques, it can much more precisely acquire the linguistic knowledge necessary to accurately disambiguate tokens based upon properties of the string context in which they appear. Accordingly, Horiguchi does not disclose, teach or suggest "a set of rules **that use the reduced regular expressions** to resolve ambiguity based upon the strings in which the ambiguity occurs" as recited in Claim 1. (emphasis added).

Further, Horiguchi does not describe "transformation sequence learning" as recited in Claim 1. Anticipation requires the disclosure in a single prior art reference of each element of the claim under consideration. *W.L. Gore & Assocs. v. Garlock*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). Further, "anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim." *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Cir. 1984) (citing *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983)) (emphasis added). Accordingly, because Horiguchi does not disclose, teach, suggest or even mention "transformation sequence learning", a *prima facie* case of anticipation has not been established.

Accordingly, for at least these reasons, Claim 1 is allowable over Horiguchi and withdrawal of the rejection is respectfully requested.

Claims 2-5 are dependent claims which directly depend from Claim 1. Accordingly, these claims are allowable based at least on this dependency, as well

as for their own recited features which are not disclosed, taught or suggested by Horiguchi. For example, Claim 4 recites "wherein the set of reduced regular expression specify types of patterns that are allowed to be explored when learning from the training set", which is not disclosed by Horiguchi, further discussion of which may be found in relation to Claim 6. Accordingly, withdrawal of the rejection is respectfully requested.

Claim 6 recites "wherein the set of reduced regular expressions specify types of patterns that are allowed to be explored when learning from the training set". The Office asserts Horiguchi at column 15, lines 66-67 and Column 16 lines 1-25 for such disclosure, the portion of which is again excerpted as follows:

> Using this method, the system learns the types of things that the user says and improves system performance of the hypothesis construction component. The effect is that the correct hypothesis will be presented to the user as the most likely hypothesis more and more often as the user uses the device.
> FIG. 12 shows the hypothesis selection components of a speech translation system of an embodiment of the present invention. Operation begins with the receipt of a speech input 1201 at the acoustic speech recognition component 1202. The acoustic speech recognition component 1202 accesses and uses at least one word pronunciation dictionary 1222 and at least one acoustic model 1224 to generate at least one data structure 1204 encoding hypothesized words and their corresponding positions and time. The data structure information 1204 is used for utterance hypothesis construction 1206, wherein an ordered list of utterance hypotheses 1208 are produced. User selection-configuration 1210 then takes place, wherein a user selects the best utterance hypothesis 1210. User selection-configuration is accomplished through a user interface 1298. The user selection is used as an adaptation input 1226 to the speech translation system language models 1228. The best utterance hypothesis 1212 is used as an input to the translation component 1214 and the speech synthesis component 1216 of the speech translation system, which produce a translated

speech output 1299. *Horiguchi, Col. 15, Line 66 to Col. 16, Line 25.*

As shown in the above excerpted portion, Horiguchi does not even mention "types of patterns that are allowed to be explored when learning from the training set" as recited in Claim 6. Horiguchi does not show these claimed aspects nor address learning issues. Indeed, Horiguchi does not even describe learning as involving any pattern whatsoever. Rather, Horiguchi focuses on translation processes that presume an already trained system.

As previously described in relation to Claim 1, Horiguchi is also silent as to the claimed aspect of the reduced regular expressions. As such, Horiguchi offers no discussion of describing patterns using reduced regular expressions as a way to enable machine-base learning. For these reasons, and the reasons previously submitted, Claim 6 is allowable over Horiguchi. Applicant respectfully requests that the §102 rejection of Claim 6 be withdrawn.

Claims 7-10 are dependent claims which directly depend from Claim 6. Accordingly, these claims are allowable based at least on this dependency, as well as for their own recited features which are not disclosed, taught or suggested by Horiguchi. For example, Claim 9 recites "wherein the learning comprises transformation sequence learning to create a set of rules that use the reduced regular expressions to resolve ambiguity based upon the strings in which the ambiguity occurs", which is not disclosed by Horiguchi as previously described in relation to Claim 1. Additionally, Claim 10 recites "wherein the learning includes applying a set of very reduced regular expressions that are a proper subset of the reduced regular expressions", which is not disclosed by Horiguchi. As previously described, Horiguchi does not even mention reduced regular expressions, and therefore cannot disclose, teach or suggest very reduced regular expressions as

recited in Claim 10. Accordingly, withdrawal of the rejection is respectfully requested.

Claims 11 and 14 recite "the reduced regular expressions ... specify types of patterns that are allowed to be explored when the knowledge base is learned". The Office asserts Horiguchi at column 31, claim 31 for such disclosure, which is excerpted as follows:

> 27. A computer readable medium containing executable instructions which, when executed in a processing system, cause the system to perform a method for performing language translation, the method comprising: receiving an input that is representative of at least one word in a source language;
>
> generating at least one recognition hypothesis in the source language in response to the input;
>
> selecting a best hypothesis from the at least one recognition hypothesis in the source language;
>
> presenting the best hypothesis in the source language to a user;
> presenting alternatives to a portion of the best hypothesis in the source language to the user;
>
> receiving an indication of a choice of one of the alternatives from the user; and
>
> presenting a revised version of the best hypothesis including the alternative chosen to the user. *Horiguchi, Col. 31, Claim 27.*

As shown in the above excerpted claim, Horiguchi merely describes selection of a hypothesis by a user and presenting a revised version of the best hypothesis to the user. Horiguchi does not disclose, teach or suggest "wherein the reduced regular expressions ... specify types of patterns that are allowed to be explored when the knowledge base is learned". The referenced section does not even mention

learning or patterns. Accordingly, for at least this reason, Claim 11 is allowable over Horiguchi and withdrawal of the rejection is respectfully requested.

Claim 12 is a dependent claim which directly depends from Claim 11. **Claim 15** is a dependent claim which directly depends from Claim 14. Accordingly, these claims are allowable based at least on their respective dependencies, as well as for its own recited features which are not disclosed, taught or suggested by Horiguchi. For example, Claims 12 and 15 recite "wherein the applying includes applying a set of very reduced regular expressions that are a proper subset of the reduced regular expressions", which is not disclosed by Horiguchi as described in greater detail in relation to Claim 13. Accordingly, withdrawal of the rejection is respectfully requested.

Claim 13 recites "applying reduced regular expression to describe a pattern in the string, wherein the applying includes applying a set of very reduced regular expressions that are a proper subset of the reduced regular expressions", which is not disclosed, taught or suggested by Horiguchi. The Office asserts Horiguchi at column 14, lines 36-55, which is excerpted as follows:

> A matching and transfer is then performed, wherein an initial fast match 1108 is performed that quickly checks compatibility of the input and the example database. This initial fast match 1108 eliminates the necessity of carrying out a time and space consuming detailed match for every example in the example database. A detailed or best match 1110 is performed as an optimization procedure over operations to insert, delete or join (match up) 1112 parts of the syntactic representation. This provides a flexible way to match that does not require all parts of the structure to be accounted for since insertions and deletions are possible. Using this approach, multiple examples may be identified and combined 1114 to match an input because the matching and transfer procedure works recursively over parts of the shallow syntactic input structure. The method described herein for

> matching and transfer is general in the sense that it does not depend on examples of any particular degree of linguistic specificity; it works with very general examples as well as with very specific examples that include a great deal of context on which the translation depends. *Horiguchi, Col. 14, Lines 36-55.*

As shown in the above excerpt, Horiguchi merely describes a "fast match" and a "detailed match". As previously described in relation to Claim 1, Horiguchi does not disclose, teach or suggest "reduced regular expressions". Accordingly, Horiguchi does not disclose, teach or suggest "a set of very reduced regular expression that are a proper subset of the reduced regular expressions". Nowhere in Horiguchi is a reduction in expressiveness even mentioned. Accordingly, withdrawal of the rejection is respectfully requested.

Claim 16 recites "construct a graph having a root node that contains a primary position set of the training set and multiple paths from the root node to secondary nodes that represents a reduced regular expression, the secondary node containing a secondary position set to which the reduced regular expression maps", "score the secondary nodes to identify a particular secondary node", and "identify the reduced regular expression that maps the path from the root node to the particular secondary node". Horiguchi does not disclose, teach or suggest these aspects.

Horiguchi does not describe reading, constructing and scoring as claimed. The Office argues that Horiguchi discloses receiving an input, generating one recognition hypothesis and selecting a best hypothesis is a learning or training process. Applicant disagrees, as there is no discussion in Horiguchi as to reading a training set, such as a properly tagged corpus. Further, Horiguchi fails to disclose, teach or suggest reduced regular expressions as described previously.

Moreover, Horiguchi fails to disclose constructing a graph having a root node that contains a primary position set *of the training set* and multiple paths from the root node to secondary nodes that represents a reduced regular expression, the secondary node containing a secondary position set to which the reduced regular expression maps as claimed. The Office argues that this is shown in FIG. 6. The Applicant disagrees. FIG. 6 shows a tree structure of a parsed input sentence. The Office asserts that FIG. 6 is applicable because it is a graph, it has been formed, it has nodes, and it has a root node, and it has secondary positions or expressions. Applicant disagrees. Horiguchi does not describe learning or a training set. Therefore, Horiguchi does not describe constructing the graph from the training set. FIG. 6 does not disclose a graph with nodes that represent reduced regular expressions as a way to describe a string for learning purposes.

Horiguchi also fails to disclose "scor[ing] the secondary nodes to identify a particular secondary node". Even assuming for the sake of argument alone that a graph is shown, each and every claim element must be shown. Horiguchi does not address "scoring". As stated above, Horiguchi does not contain teaching or suggestion for a graph with nodes to describe a string for learning purposes. Indeed, Horiguchi does not disclose learning as claimed. Therefore, there is no disclosure, motivation, teaching or suggestion for scoring the secondary nodes to identify a particular secondary node as claimed.

For these reasons, Claim 16 is allowable over Horiguchi and withdrawal of the rejection is respectfully requested.

Claims 17 and 20 recite "the reduced regular expressions specify types of patterns that are allowed to be explored when the knowledge base is learned".

Horiguchi does not show these claimed aspects nor address learning issues. Further, Horiguchi does not even describe learning as involving any type of pattern whatsoever. Horiguchi is also silent as to the claimed aspect of the reduced regular expressions. For these reasons, and the reasons previously submitted, Claims 17 and 20 are allowable over Horiguchi. Applicant respectfully requests that the §102 rejection of claims 17 and 20 be withdrawn.

Claims 18-19 are dependent claims which directly depend from Claim 17. Accordingly, these claims are allowable based at least on their respective dependencies, as well as for its own recited features which are not disclosed, taught or suggested by Horiguchi. For example, Claim 19 recites "transformation sequence learning to create a set of rules that use the reduced regular expressions to describe the strings", which as previously described in relation to Claim 1 is not disclosed by Horiguchi. Accordingly, withdrawal of the rejection is respectfully requested.

Conclusion

All pending claims 1-20 are in condition for allowance. Applicant respectfully requests reconsideration and prompt issuance of the subject application. If any issues remain that prevent issuance of this application, the Examiner is urged to contact the undersigned attorney before issuing a subsequent Action.

Respectfully submitted,

Dated: 9/27/04 By: _____

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